

BRIEF REPORT

Workplace responses to COVID-19 associated with mental health and work performance of employees in Japan

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Abstract

Objectives: The study investigated the links between workplace measures implemented in response to COVID-19 with mental health and work performance of employees in Japan.

Methods: This was a cross-sectional study of a sample from a cohort study of full-time employees. Participants (n = 1448) completed an online self-report questionnaire on March 19–22, 2020. Multiple linear regression was conducted to ascertain their fear of and worry associated with COVID-19, psychological distress, and work performance.

Results: The number of workplace measures correlated positively with respondents' fear of and worry associated with COVID-19 (adjusted standardized $\beta = 0.123$, $P < .001$), negatively with psychological distress and positively with work performance (adjusted standardized $\beta = -0.068$, $P = .032$; adjusted standardized $\beta = 0.101$, $P = .002$; respectively).

Conclusions: Workplace measures may promote and maintain the mental health and work performance of employees during the COVID-19 epidemic. The positive association between the number of measures and fear and worry about COVID-19 may reflect increased awareness about COVID-19 among employees resulted from taking the measures.

KEYWORDS

anxiety, COVID-19, infection, occupational health, SARS-CoV-2

1 | INTRODUCTION

The novel coronavirus (COVID-19) pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has become a global problem. Many governments have declared health emergencies to combat the coronavirus, enforcing physical distancing, stay-at-home

orders, travel restrictions, and the closure of nonessential businesses.¹ The United States Center for Disease Control (CDC) published a guidance for preventive actions for the COVID-19. These include education for employees, such as sending sick employees home, facilitating work from home, reducing business travel, and avoiding social gatherings.² Some employees have been required to take

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immediate action to change their work styles under the direction of their company or organization without preparation. Others must continue their usual work. Moreover, with COVID-19, many people report greater fear, worry, and psychological stress.^{3–6} Employees' performance could also suffer as a result. It would be meaningful to know if the workplace measures taken by employers could reduce employees' fear and worry about COVID-19 and maintain acceptable work performance.

This study examines the relationship between the implementation of workplace measures and employees' fear and worry about COVID-19, psychological distress, and self-rated work performance in an early stage of the pandemic in Japan.

2 | SUBJECTS AND METHODS

2.1 | Study design, participants, and procedure

This study was a cross-sectional online survey. Participants were enrolled from the online cohort of full-time employees in February 2019 ($n = 4120$). The cohort was based on the following inclusion criteria: (a) residence in Japan; (b) full-time employee; and (c) age from 20 to 59. For more than 500 000 potential participants representing community-dwelling people across Japan, an Internet survey company (Macromill, Inc) invited them to take the survey until the sample size was reached with an equally collected sample based on gender (male and female) and age (20–29, 30–39, 40–49, and 50–59 years old). Using the 2019 cohort, we repeated the online survey from March 19 to March 22, 2020. Respondents were voluntarily offered to participate and gave fully informed consent through the Internet. Participants were assured that researchers did not request or obtain their private information (eg, name, phone number) from the online survey company.

2.2 | Measurement variables

2.2.1 | Workplace measures for COVID-19

The preventive measures implemented at workplaces for COVID-19 were assessed on an original scale. Based on the conceptual categories of recommendation for workplace measures in a previous outbreak of novel influenza in Japan,⁷ occupational physicians (NS, RK, and NK) and an occupational health researcher (KT) discussed the listing of the items. The final scale consisted of 23 workplace measures taken in response to COVID-19 (Appendix 1). The items were arranged into seven categories: (a) preventive measures

taken by individuals; (b) preventive measures taken to reduce the risk of infection in the workplace; (c) criteria and procedure for waiting at home and clinical contact; (d) temporary leave when infected or pandemic; (e) information about accommodation of high-risk people; (f) introduction of reliable information resources; and (g) information on the duration of special measures. The response was dichotomized; respondents who answered “newly implemented” or “normally implemented” were categorized as “Yes”; respondents who answered “not implemented” or “not applicable” were categorized as “No.” We calculated the number of “yes” responses to sum, ranging from 0 to 23. The number of each workplace measure was created to sum of items of each category from (a) to (d).

2.2.2 | Employee outcomes

Global fear and worry about COVID-19

An original scale was used to ask whether participants fear COVID-19. Global concerns about COVID-19 were measured by asking “Do you feel anxiety about COVID-19?” Responses were scored along a 6-point Likert-type scale (ranging from 1 “Not at all” to 6 “Feel strongly”).

Psychological distress

Psychological distress (lack of vigor, anger-irritability, fatigue, anxiety, and depression) in the last 30 days was evaluated using corresponding scales of the Brief Job Stress Questionnaire (BJSQ).^{8,9} All items were rated on a four-point Likert scale from 1 (“Never”) to 4 (“Almost always”). The sum of its subscale was calculated as a score, with higher scores indicating greater distress. Reliability and validity of BJSQ among Japanese employees have been established.¹⁰

Work performance

Work performance was evaluated using one item of the WHO Health and Work Performance Questionnaire (HPQ).¹¹ Participants were asked to rate their overall work performance over the past 4 weeks. Items are scored on an 11-point scale ranging from 0 (worst) to 10 (best). A high score indicates good work performance. Reliability and validity of Japanese version of HPQ are reported elsewhere.¹²

2.3 | Statistical analysis

We conducted multiple linear regression analyses to examine the relationship between the number of workplace measures implemented and global fear of COVID-19, psychological distress, and job performance of respondents, adjusting for gender, age, marital status, child(ren), occupation, company size, and type of industry. Statistical significance was set as a

two-sided $P < .05$. SPSS 26.0. Japanese version (SPSS Inc) was used.

This study was approved by the Research Ethics Committee of the Graduate School of Medicine/Faculty of Medicine, The University of Tokyo (No. 10856-(2)).

3 | RESULTS

A total of 1448 participants completed an online self-report questionnaire. We excluded unemployed respondents ($n = 27$) and respondents who reported their company size was unknown ($n = 42$). The final sample consisted of 1379 respondents. Participants' characteristic is presented in Table 1. The mean age was 41.2 years old ($SD = 10.5$). Final respondents ($n = 1379$) were significantly less likely to have a child(ren) compared to those who dropped out ($n = 2,741$) ($P < .01$). There was no significant difference in gender, age, marital status, occupation or psychological distress at baseline between the two samples (data available upon request).

The result of regression analysis is shown in Table 2. The high number of preventive measures taken by a company was significantly associated with high global fear about COVID-19 (adjusted standardized $\beta = 0.123$, $P < .001$). However, it was significantly associated with low psychological distress (adjusted standardized $\beta = -0.068$, $P = .032$) and high job performance (adjusted standardized $\beta = 0.101$, $P = .002$). The measures of criteria and procedure for waiting at home and clinical contact were significantly associated with high job performance (adjusted standardized $\beta = 0.092$, $P = .032$).

4 | DISCUSSION

Contrary to our initial expectations, the number of workplace measures taken to respond to COVID-19 was positively associated with global fear of COVID-19. Increased awareness of the risk of COVID-19 in relation to the kind of workplace measures implemented may also increase employees' fear and worry about the virus. It is also possible that companies and organizations whose employees are most worried about COVID-19 took more actions against it. However, our findings indicate that the number of workplace measures was negatively associated with employees' psychological distress and positively with their performance. It suggests that more intensive implementation of workplace measures responding to COVID-19 reduce employees' psychological distress and maintains their work performance. Concerning each category of measures, only the measures about criteria and procedure for waiting at home and clinical contact had a significant impact on high job performance. Providing criteria by employer

TABLE 1 Participants' characteristics ($N = 1379$)

	N (%)	Mean (SD) [min-max]
Gender		
Male	698 (50.6)	
Female	681 (49.4)	
Marital status		
Single	672 (48.7)	
Married	707 (51.3)	
Child(ren)		
None	796 (57.7)	
One or more	583 (42.3)	
Age mean		41.2 (10.5) [21-60]
20-29 years old	264 (19.1)	
30-39 years old	376 (27.3)	
40-49 years old	355 (25.7)	
50-59 years old	361 (26.2)	
>60 years old	23 (1.7)	
Type of industry		
Manufacturing	336 (24.3)	
Information and technology services	100 (7.3)	
Retail and wholesale business	142 (10.3)	
Finance, insurance, real estate	113 (8.2)	
Professional and technical services	81 (5.9)	
Eating/drinking, hotel business	21 (1.5)	
Life-related services and entertainment	100 (7.2)	
Education and learning support	53 (3.8)	
Medical and welfare	190 (13.8)	
Transportation	60 (4.4)	
Construction	51 (3.7)	
Agriculture and industry	6 (0.4)	
Public servant	111 (8.0)	
Others	15 (1.1)	
Company size		
>1000 employees	456 (33.1)	
300-999	229 (16.6)	
50-299	377 (27.3)	
<50	317 (23.0)	
Occupational type		
Managers	125 (9.1)	
Nonmanual	863 (62.6)	
Manual	391 (28.4)	

Abbreviation: SD, standard deviation.

TABLE 2 Association between the workplace measures and global fear and worry about COVID-19, psychological distress, and job performance among Japanese workers (N = 1379)

Variables [possible range]	Global fear and worry about COVID-19				Psychological distress				Job performance			
	Crude		Adjusted ^a		Crude		Adjusted ^a		Crude		Adjusted ^a	
	β^b	P	β^b	P	β^b	P	β^b	P	β^b	P	β^b	P
The number of implemented workplace measures [0-23]	0.100	<.001**	0.123	<.001**	−0.088	.001**	−.068	.032*	0.104	<.001**	0.101	.002**
(a) Preventive measures taken by individuals [0-5]	0.063	.055	0.044	.198	−0.033	.319	−.032	.355	0.030	.367	0.030	.386
(b) Preventive measures to reduce the risk of infection at workplace [0-8]	−0.037	.335	−0.012	.764	0.053	.166	.055	.171	−0.038	.318	−0.023	.563
(c) Criteria and procedure for waiting at home and clinical contact [0-4]	0.056	.181	0.051	.226	−0.020	.636	−.022	.605	0.099	.018*	0.092	.032*
(d) Temporary leave when infected or pandemic [0-3]	0.020	.607	0.031	.430	−0.044	.267	−.031	.442	−0.038	.330	−0.043	.288
(e) Information about accommodation of high-risk people [0, 1]	−0.004	.912	−0.003	.924	−0.025	.489	−.017	.644	0.044	.211	0.038	.292
(f) Introduction of reliable information resources [0, 1]	0.035	.321	0.038	.274	−0.042	.236	−.040	.255	0.009	.795	0.004	.919
(g) Information on the duration of special measures [0, 1]	0.007	.835	0.014	.693	−0.023	.506	−.013	.717	0.040	.244	0.039	.271

^aAdjusted by sex, age, marital status, child, occupation, company size, and industry.^bStandardized β .* $P < .05$; ** $P < .01$.

may allow workers to concentrate on their job. Although the effects of other individual measures were neither significant nor consistent, having information about accommodating high-risk people showed a preferable trend on all outcomes. Careful consideration of vulnerable workers may be beneficial for all workers. Workplace measures responding to COVID-19 may support and maintain mental health and work performance of employees during the COVID-19 pandemic.

Considering the large population of workers, the occupational health sector and company stakeholders have an important role not only in limiting the movements of their employees to prevent transmission of the virus, but also to protect their health.

5 | LIMITATIONS

Some possible limitations should be noted. First, this study was cross-sectional, thus it was impossible to draw a conclusion about a causal association. Second, the study used a sample recruited from an Internet survey company, so there

is a possibility of selection bias. Third, the sample consisted only of full-time employees. Generalizability of the findings to the whole working population is therefore limited. Fourth, the study was based on responses from individual employees, not companies or organizations, thus the implementation of workplace measures might have been underestimated. Fifth, some important covariates were not adjusted in this study, such as educational attainment and working from home as an individual characteristic; trust in employers as a company or organizational characteristic; and urbanity and commuting (ie, using public transport or not), that may cause confounding bias. Finally, the study was conducted at a single point of time during an early stage of the outbreak of COVID-19 in Japan. The findings may be different at middle, and late stages of the pandemic.

6 | CONCLUSION

Intensive workplace measures for COVID-19 were associated with employees' low psychological distress and high work performance, but positively associated with their fear of

COVID-19. Workplace measures may be beneficial for promoting and maintaining employees' mental health and work performance during the COVID-19 pandemic. The positive association between the number of measures and fear and worry about COVID-19 may reflect increased awareness about COVID-19 among employees resulted from taking the measures.

DISCLOSURE

Approval of the research protocol: This study was approved by the Research Ethics Committee of the Graduate School of Medicine/Faculty of Medicine, The University of Tokyo, No. 10856-(2).

Informed consent: Online informed consent was obtained from all participants with full disclosure and explanation of the purpose and procedures of this study. We explained that their participation was voluntary, and they can withdraw consent for any reason, simply by not completing the questionnaire.

Registry and registration number of the study/trial: N/A.
Animal studies: N/A.



CONFLICT OF INTEREST

None reported.

AUTHOR CONTRIBUTION

NK was in charge of this study, supervising the process and of providing his expert opinion. NS and NK organized the study design and analyzed the data. Collaborators RK and KT ensured that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved. All authors participated in conducting the survey. NS and NK wrote the first draft of the manuscript, and all other authors critically revised it. All authors approved the final version of the manuscript.

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REFERENCES

- Gostin LO, Wiley LF. Governmental public health powers during the COVID-19 pandemic: stay-at-home orders, business closures, and travel restrictions. *JAMA*. 2020;323(21):2137–2138.
- Control TUSCfD. Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 (COVID-19): Plan, Prepare and Respond to Coronavirus Disease 2019. 2020. <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>
- Li S, Wang Y, Xue J, Zhao N, Zhu T. The impact of COVID-19 epidemic declaration on psychological consequences: a study on active weibo users. *Int J Environ Res Public Health*. 2020;17(6):2032.
- Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry*. 2020;33(2):e100213.
- Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: mental health consequences and target populations. *Psychiatry Clin Neurosci*. 2020;74(4):281–282.
- Wang C, Pan R, Wan X, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in china. *Int J Environ Res Public Health*. 2020;17(5):1729.
- Wada K, Suzuki H, Imai T, Aizawa Y. A tool for supporting decision making for occupational health practitioners at the occurrence of novel influenza. *Sangyo Eiseigaku Zasshi*. 2012;54(2):77–81.
- Inoue A, Kawakami N, Shimomitsu T, et al. Development of a short questionnaire to measure an extended set of job demands, job resources, and positive health outcomes: the new brief job stress questionnaire. *Ind Health*. 2014;52(3):175–189.
- Wada K, Sairenchi T, Haruyama Y, Taneichi H, Ishikawa Y, Muto T. Relationship between the onset of depression and stress response measured by the Brief Job Stress Questionnaire among Japanese employees: a cohort study. *PLoS One*. 2013;8(2):e56319.
- Shimomitsu T, Ohno H, Maruta T, Tanigawa T. *Investigation research report concerning prevention of disease related to work in 1997 the Ministry of Labor: III Stress measurement research group report*. Tokyo: Tokyo Medical University; 2000:101–169.
- Kessler RC, Barber C, Beck A, et al. The world health organization health and work performance questionnaire (HPQ). *J Occup Environ Med*. 2003;45(2):156–174.
- Kawakami N, Inoue A, Tsuchiya M, et al. Construct validity and test-retest reliability of the World Mental Health Japan version of the World Health Organization Health and Performance Questionnaire Short Version: a preliminary study. *Ind Health*. 2020. <https://doi.org/10.2486/indhealth.2019-0090>.

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APPENDIX 1

The scale of Workplace measures to respond to COVID-19

Workplace measures to respond to COVID-19

(a) Preventive measures taken by individuals

Hand washing, gargle enforcement

Encouraging finger alcohol disinfection

Encourage wearing masks

Enforce cough etiquette

Enforcement of temperature measurement

(b) Preventive measures to reduce the risk of infection in the workplace

Cancel or postpone internal or external business events

Disinfection of the work environment

Refrain from traveling overseas

Restrictions on eating, drinking, and entertainment for work

Enforcement of staggered work

Encourage telework and telecommuting (including remote work)

Changing the working environment (desk layout, flow lines, etc)

Restrictions on the use of employee cafeterias

(c) Criteria and procedure for waiting at home and clinical contact

Request to refrain from going to work when ill

Report request for fever

Dissemination of information on home remedies and consultations for COVID-19

Waiting at home if you have a history of staying abroad

(d) Temporary leave when infected or pandemic

Providing information on how to deal with infected cases in the workplace

Providing information on treatment (pay etc) when waiting at home

Provision of information on treatment (payment, etc) when taking leave due to infection

(e) Information about accommodation of high-risk people

Consideration for staff who are at high risk of serious illness in case of infection (elderly people, pregnant women, etc)

(f) Introduction of reliable information resources

Announcement of reliable information collection destinations (such as the Ministry of Health, Labor and Welfare website)

(g) Information on the duration of special measures

Providing information on how long special measures will be taken

Implementation of preventive measures (any)